01 - Review Part 1 – Numbers & Operations

Real Numbers (all numbers)

Rational

- Includes all the integers, plus all fractions or terminating decimals and repeating decimals

Irrational

- A number with a decimal that neither terminates or repeats
  Example: $\sqrt{2}$

Integers

- All whole numbers & their opposites

-3, -2, -1, 0, 1, 2, 3

Whole Numbers

- All natural numbers + zero

Natural Numbers

- All positive counting numbers (not including zero)

<u>Part A: Operations with integers</u>

1. Addition

ex1: (-12) + (-5)

or

$= (-12) - 5$

$= -17$

ex2: 18 + (-5)

or

$= 18 - 5$

$= 13$

2. Subtraction

ex1: -15 – (-8)

$= -15 + 8$

$= -7$

ex2: 10 – x let x = -2

$= 10 - (-2)$

$= 12$

3. Multiplication and Division

ex1: 6×8

$= 48$

ex2: $(-36) \div (-9)$

$= 4$

$\div$

$- \times - = +$

$- \times + = -$

$+ \times - = -$

$+ \times + = +$

ex3: -5×9

$= -45$

ex4: $54 \div (-6)$

$= -9$

More Than One Operation

B	Brackets
E	Exponents
D	Division
M	Multiplication
A	Addition
S	Subtract

} whichever comes 1st

} whichever comes 1st

ex1: $-10 \times (-4) + 10 \div (-5)$

$= 40 + -2$

$= 38$

ex2: $-6 + 9 \times -5$

$= -6 - 45$

$= -51$

Part B: Operations with Rational Numbers

Addition and Subtraction

$\frac{-2}{5} + \frac{3}{-2} - \frac{3}{10}$ (×2, ×5, ×1)

$= \frac{-4}{10} + \frac{15}{-10} - \frac{3}{10}$

$= \frac{-4}{10} - \frac{15}{10} - \frac{3}{10}$

$= \frac{-22}{10}$

$= -\frac{11}{5}$ Reduce

Multiplication

$\frac{3}{4} \times \frac{-4}{5} = \frac{-3}{5}$

$\frac{-12}{20}$ Reduce

Division

$\frac{3}{4} \div \frac{5}{-4}$

$\frac{3}{4} \times \frac{-4}{5} = \frac{-3}{5}$

More than **One** operation: follow BEDMAS

$\frac{3}{4} \times \frac{-4}{5} \div \frac{-3}{7}$

$= \frac{-3}{5} \times \frac{7}{-3}$

$= \frac{+7}{5}$

$2^4 \div 2^2 = 2^{4-2} = 2^2$

$2^4 \cdot 2^2 = 2^{4+2} = 2^6$

$(2^4)^2 = 2^8$

Part C: Exponent Laws

Multiplication	$(a^m)(a^n) = a^{m+n}$
Division	$\frac{a^m}{a^n} = a^{m-n}$
Power of a Power	$(a^m)^n = a^{mn}$

Examples:

1) $(5^4)(5^{-3})=$ 5^1

2) $\frac{4^6}{4^{-2}}=$ $4^{6-(-2)} = 4^8$

3) $(3^2)^4=$ 3^8

Remember….

$\frac{-1}{3}, \frac{1}{(-3)}, -\frac{1}{3}, -\left(\frac{1}{3}\right)$ are all the same

The following mixed numbers are all equal

$-1\frac{1}{6}, -\left(1\frac{1}{6}\right), \frac{(-7)}{6}, \frac{7}{(-6)}, -\frac{7}{6}$

Exponents: What is the difference???

-3^2 $(-3)^2$ $-(-3)^2$ $-(3)^2$

$= -9$ $= 9$ $= -9$ $= -9$

Assigned Work

p. 461 # 1,3,4,5

p. 462 # 1,2

p. 463 #1-5